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2010 EVALUATION OF SPINNING-WING DUCK DECOY BAN AT SHIAWASSEE RIVER STATE GAME AREA

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ABSTRACT

A survey of duck hunters was completed to estimate the number of hunters using spinning-wing decoys (SWDs) at Shiawassee River State Game Area (SGA) in 2009 and to determine their opinions about hunting duck with SWDs and the ban on SWDs in 2010. In 2009, prior to the ban of SWDs, 78% of the hunters at Shiawassee River SGA used SWDs. About 45% of duck hunters during 2009 and 2010 approved of the use of SWDs to hunt ducks at Shiawassee River and 31% disapproved of using SWDs. Duck hunters using SWDs at Shiawassee River SGA in 2009 were significantly more efficient at harvesting ducks than hunters that did not use SWDs. Among the duck hunters in 2009 and 2010 combined, 72% indicated the ban had not changed how frequently they hunted at Shiawassee River SGA. The ban of SWDs lead to a net loss of about 50 duck hunters in 2010. More hunters reported the ban reduced their duck harvest than hunters that reported an increase in harvest. The ban of SWDs marginally improved the quality of hunt for hunters. Compared to 2010, the net effect of the ban of SWDs on hunting effort in the next two years is predicted to be negligible.

INTRODUCTION

The Michigan Natural Resources Commission (NRC) and Department of Natural Resources (DNR) have the authority and responsibility to protect and manage the wildlife resources of the state of Michigan. Beginning in 2010, the NRC banned spinning-wing decoys (SWDs) from the managed waterfowl hunts coordinated by the DNR at Shiawassee River State Game Area (SGA) on an experimental basis for three years. This ban was enacted at the request of the Shiawassee Flats Citizens and Hunters Association (SFCHA).



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Although research has shown no conclusive biological impacts from the use of SWDs, SFCHA proposed the ban because the use of these decoys could negatively impact the hunting experience of other hunters sharing the same area. Some hunters reported SWDs sometimes spooked ducks from an entire area during certain periods of the season.

Opinion surveys are one of the management tools used by the NRC and DNR to accomplish their statutory responsibility. The main objectives of this study were to estimate the number of hunters using SWDs in 2009 and to determine the opinions of hunters about the use of SWDs and the ban of SWDs in 2010.

METHODS

Shiawassee River SGA conducts random drawings for waterfowl hunting opportunities on the property. Hunting parties (≥ 1 hunters) chosen to hunt ducks were required to report the number of ducks harvested and hours spent hunting.

Following the duck hunting season, a questionnaire (Appendix A) was sent to 2,436 people that had been selected to hunt ducks at Shiawassee River SGA in either 2009 or 2010. Hunters receiving the questionnaire were asked to report if they hunted ducks, number of days spent afield, and number of ducks they harvested with and without the aid of SWDs. Hunters also were asked to indicate their opinion about the use of SWDs and the ban of SWDs at Shiawassee River SGA.

Estimates were calculated using a simple random sampling design (Cochran 1977) and were presented along with their 95% confidence limit (CL). This confidence limit can be added and subtracted from the estimate to calculate the 95% confidence interval. The confidence interval is a measure of the precision associated with the estimate and implies that the true value would be within this interval 95 times out of 100. Because hunters were required to report their harvest and hunting effort at Shiawassee River SGA, estimates of hunter numbers, hunting effort (days afield), harvest, and effort per harvested duck derived from the survey were adjusted to match known quantities reported by hunters (i.e., bias adjusted estimates). Estimates associated with questions about opinions towards regulations were not adjusted for possible response or nonresponse bias because no adjustment factors were available.

Estimates were calculated among hunters participating in 2009 and 2010 separately (i.e., before and after the SWD ban) and also among all hunters from either year. Furthermore, estimates were calculated separately among hunters that had used SWDs and among hunters that did not use SWDs in 2009.

Statistical tests are used routinely to determine the likelihood that the differences among estimates are larger than expected by chance alone. The overlap of 95% confidence intervals was used to determine whether estimates differed. Non-overlapping 95% confidence intervals was equivalent to stating that the difference between the means was larger than would be expected 995 out of 1,000 times, if the study had been repeated (Payton et al. 2003).

Questionnaires were mailed initially during early January 2011, and up to two follow-up questionnaires were mailed to nonrespondents. Although 2,436 people were sent the

questionnaire, 147 surveys were undeliverable resulting in an adjusted sample size of 2,289. Questionnaires were returned by 1,538 people, yielding a 67% adjusted response rate.

RESULTS

Hunting at Shiawassee River SGA

Estimates of the number of hunters, hunting effort (days afield), ducks harvested, and hunting effort per harvested duck were calculated initially without any adjustments for biases (Table 1). Because hunters were required to report their harvest and hunting effort at Shiawassee River SGA, these initial estimates were adjusted to match known quantities reported by hunters (Table 2). Data from 2010 only was used to calculate adjustments because hunting activity for 2009 was collected separately by hunting method (with or without SWDs); thus, hunters in 2009 could double report hunting effort if the hunter used both hunting methods in the same day. Unadjusted estimates of hunter numbers at Shiawassee River SGA in 2010 exceeded the number of registered hunters by 11% (Table 2). Furthermore, hunting effort was overestimated by 73% and harvest was overestimated by 135%, compared to tallies compiled at Shiawassee River SGA. In contrast, the estimate of effort per harvested duck in 2010 was under estimated by 27%.

During 2009 and 2010 combined, 2,436 people were selected to hunt ducks at Shiawassee River SGA. About $95 \pm 1\%$ of these people went afield to hunt ducks in either 2009 or 2010 ($2,087 \pm 14$ hunters). Nearly equal numbers of people hunted ducks in both years; an estimated $1,664 \pm 28$ people hunted ducks in 2009, and $1,638 \pm 29$ people hunted ducks in 2010. In 2009, about 1,305 people hunted ducks using SWDs, and 729 people hunted ducks without SWDs (Table 3). Among the 2009 hunters, $78 \pm 1\%$ hunted at least once with SWDs and $44 \pm 1\%$ hunted at least once without SWDs. [The sum of hunters using SWDs and hunters not using SWDs does not equal 100% because some hunters used both hunting methods.]

Based on summaries compiled at Shiawassee River SGA (i.e., mandatory check tally), 1,732 hunters spent 6,290 days afield and harvested 8,207 ducks in 2009. In contrast, 1,638 hunters spent 6,140 days afield and harvested 7,084 ducks in 2010. Thus, the number of people hunting ducks at Shiawassee River SGA declined 5% between 2009 and 2010; hunting effort declined 2%; and the number of ducks harvested declined 13%.

The number of days of hunting required to harvest a duck in 2009 was 0.73 days among hunters that used SWDs and 0.93 days among hunters that did not use SWDs (Table 3 and Figure 1). In 2010, after the SWDs were banned, it took hunters 0.87 days of hunting effort to harvest a duck. None of these estimates of hunting efficiency were significantly different; however, these comparisons were confounded by different hunters participating between years and because some hunters used both hunting methods during the same day. Thus, estimates of hunting efficiency were also calculated separately among the hunters that hunted both years. Furthermore, comparisons between years were restricted to hunters that only hunted using one hunting method in 2009 (i.e., hunted only with a SWD or without SWDs). Among hunters that hunted both years and did not use SWDs, they devoted 1.00 ± 0.13 days of effort per duck harvested in 2009 and 0.94 ± 0.10 days of effort per duck in 2010 (Figure 2). These estimates were not significantly different between years. Among hunters that hunted ducks

both years but had used SWDs in 2009, they devoted 0.69 ± 0.03 days of effort per duck harvested in 2009 and 0.88 ± 0.04 days of effort per duck in 2010 (Figure 2). Estimates of efficiency were significantly different between years; it required 28% less effort for the same hunter to harvest a duck using SWDs in 2009 than without SWDs in 2010.

Among all duck hunters at Shiawassee River SGA in either 2009 or 2010, 45% approved of the use of SWDs to hunt ducks and 31% disapproved of using SWDs (Table 4). The levels of approval and disapproval of SWDs were not significantly different between 2009 and 2010 hunters. The highest levels of approval were reported among hunters that had used SWDs in 2009 (45-56% approval, Table 4), and the highest levels of disapproval were generally reported among hunters that had not used SWDs in 2009 (35-38% disapproval).

Among the people hunting ducks in 2010, $90 \pm 1\%$ indicated they were aware of the ban before they had arrived at Shiawassee River SGA to hunt ducks. Among the people hunting ducks in 2010, 29% indicated the SWD ban improved the quality of their hunt, 21% reported decreased hunt quality, and 49% were not sure whether the ban had changed the quality of their hunt (Table 5). Among 2010 hunters that had used SWDs in 2009, 33% reported the ban had improved the quality of their hunt and 27% reported the ban lowered the quality of their hunt. In contrast, among 2010 hunters that had not used SWDs in 2009, 34% reported the ban had improved the quality of their hunt and 11% reported the ban lowered the quality of their hunt.

Among the duck hunters in 2009 and 2010 combined, 72% (1504 ± 31 hunters) indicated the ban had not changed how frequently they hunted at Shiawassee River SGA (Table 6). About 5% of hunters (105 ± 14) reported they hunted ducks more frequently at Shiawassee River SGA because of the ban, and 13% (277 ± 22 hunters) indicated they hunted less frequently because of the ban.

Among the people that had used SWDs in 2009 but did not hunt in 2010 (356 hunters), 23% stopped hunting at Shiawassee River SGA because of the ban on SWDs (73 ± 12 hunters) (Table 7). Among the people that hunted only during 2010, 6% indicated they hunted more frequently at Shiawassee River SGA because of the ban (24 ± 7 hunters) (Table 6).

Among the duck hunters in 2009 and 2010 combined, 46% (950 ± 33 hunters) indicated the ban had not changed how many ducks they had taken at Shiawassee River SGA (Table 8). About 9% (192 ± 19 hunters) of these hunters reported they had taken more ducks at Shiawassee River SGA because of the ban, and 19% (405 ± 26 hunters) indicated they took fewer ducks. Thus, significantly more hunters indicated they took fewer ducks because of the SWD ban than hunters reporting taking more ducks. Among the 2009 duck hunters that had used SWDs in 2009 and also hunted in 2010, 40% reported no change in the number of ducks harvested because of the ban; however, 30% reported taking fewer ducks and 13% took more ducks because of the ban. Among the 2009 duck hunters that had not hunted with SWDs in 2009 and had also hunted in 2010, 55% reported no change in the number of ducks harvested because of the ban; however, 8% reported taking fewer ducks and 17% took more ducks because of the ban.

Among the duck hunters in 2009 and 2010 combined, 62% ($1,291 \pm 33$ hunters) indicated they would not change how frequently they hunted ducks at Shiawassee River SGA in future years

(Table 9). Nearly equal proportions of hunters indicated they planned to hunt less often (324 ± 24) as hunters that planned to hunt more often (284 ± 22) in the future. Among 2009 hunters, a higher proportion of hunters planned to hunt less often than hunters that planned to hunt more often (Table 9). Among 2010 hunters, equal proportions of hunters planned to hunt less often as hunters that planned to hunt more often (Table 9).

Hunting outside Shiawassee River SGA

When the duck hunters at Shiawassee River SGA hunt outside Shiawassee River SGA, 50% usually hunt on both private and public lands, 31% hunt primarily on public lands, and 9% hunt primarily on private lands (Table 10). When these hunters hunt outside Shiawassee River SGA, 19% always use SWDs, 18% usually use SWDs, 27% occasionally use SWDs, and 30% never use SWDs (Table 11).

Most duck hunters (57%) approved of the use of SWDs in Michigan (Table 12). About 19% of duck hunters did not approve of hunters using SWDs and 24% had no opinion (i.e., not sure).

Duck hunters were presented four statements about the use of SWDs for duck hunting throughout Michigan and were asked to indicate how much they agreed or disagreed with these statements. The four statements included: (1) the use of SWDs should never be restricted, (2) SWDs should be banned because they are unethical, (3) SWDs should be banned because if used improperly or at the wrong times they can negatively impact harvest potential and opportunities of other nearby hunters, and (4) SWDs should be regulated only if their use results in declining duck numbers and shorter hunting seasons (Tables 13-16).

About 45% of duck hunters at Shiawassee River SGA agreed that SWDs should never be restricted in Michigan (Table 13). In contrast, 33% disagreed that SWDs should never be restricted. Most duck hunters at Shiawassee River SGA (71%) disagreed that SWDs should be banned because using SWDs is an unethical hunting method (Table 14). About 34% of duck hunters at Shiawassee River SGA agreed that SWDs should be banned because when they are used improperly they can impact other hunters, but 44% disagreed that SWDs should be banned because some hunters improperly used them (Table 15). About 44% of duck hunters at Shiawassee River SGA agreed that SWDs should be regulated only if their use was implicated in causing declining duck numbers and shorter hunting seasons but 33% disagreed with this statement (Table 16).

Duck hunters were presented five options about how a ban of SWDs could be implemented in Michigan and were asked to indicate how much they agreed or disagreed with these options. The five options included: (1) ban SWDs in Michigan only if banned in all states, (2) ban SWDs in Michigan regardless of a ban in other states, (3) ban SWDs in Michigan on public lands only, (4) ban SWDs in Michigan on Managed Waterfowl Hunt Areas only, (5) ban SWDs in Michigan during parts of the hunting season only (for example, prohibit during the first few weeks) (Tables 17-21). None of these options to ban SWDs in Michigan were supported by most duck hunters at Shiawassee River SGA.

DISCUSSION

Mail surveys are a cost-efficient method of obtaining information about hunting activity, but there are many possible sources of error in surveys such as the failure of participants to provide answers (nonresponse bias), question wording, and question order (Cochran 1977, Lohr 1999, Dillman 2000). The unadjusted estimate of hunter numbers at Shiawassee River SGA in 2010 was overestimated by 11%; hunting effort was overestimated by 73%; and harvest was overestimated by 135% (Table 2). Similar to this study, Wright (1978) compared estimates of hunting activity and harvest of waterfowl hunters derived from a mail survey to information reported at a mandatory check station. The estimate of waterfowl harvest was overestimated by about 100%, and the number of hunting trips was overestimated by 35%. Wright attributed the largest source of bias associated with the harvest estimate to hunters reporting the take of hunting partners, rather than only reporting their harvest.

Because duck hunters at Shiawassee River SGA reported who accompanied them while duck hunting (i.e., party members), it was possible to recalculate waterfowl harvest assuming every hunting party member had reported the total kill of the hunting party on their survey. Assuming harvested birds were reported by all party members, hunters would be expected to report taking 16,965 ducks in 2010. The unadjusted harvest estimate of 16,666 ducks from the mail survey (Table 1) was only 2% less than what would be expected if double counting had occurred. Thus, double counting of harvested birds was potentially a major source of error in this survey.

The proportion of duck hunters statewide that normally used SWDs increased from 13% to 24% between 2001 and 2005 (Frawley 2007). About 39% of duck hunters at Shiawassee River SGA normally used SWDs when duck hunting outside Shiawassee River SGA in 2009 (Table 11); thus, it appears SWDs have become more popular since 2005. Duck hunters using SWDs at Shiawassee River SGA in 2009 appeared more efficient at harvesting ducks than hunters that did not use SWDs. Thus, the increasing popularity of SWDs appears reasonable because these decoys can attract ducks and can increase harvest of ducks over traditional hunting methods (Caswell and Caswell 2004, Szymanski and Afton 2005).

The proportion of duck hunters statewide that disapproved of using SWDs was between 17 and 21% during 2001 and 2005 (Frawley 2007). In addition, the proportion of duck hunters statewide that believed using SWDs was an unethical hunting method was between 13% and 16% during 2001 and 2005. Similarly, about 19% duck hunters at Shiawassee River SGA in 2009-2010 disapproved of using SWDs statewide (Table 12) and 12% believed using SWDs was an unethical hunting method (Table 14).

The Shiawassee Flats Citizens and Hunters Association (SFCHA) originally proposed the ban of SWDs at Shiawassee River SGA because the use of these decoys could negatively impact the hunting experience of other hunters sharing the same area. In 2009, 45% of hunters at Shiawassee River SGA approved of using SWDs, 31% disapproved of their use, and 23% were undecided (Table 4). Moreover, 35% of the duck hunters at Shiawassee River SGA in 2009 agreed that SWDs should be banned because when used improperly they could negatively impact other nearby hunters (Table 15). In contrast, 45% of hunters disagreed that SWDs should be banned because they could impact hunting activity of other hunters. Thus,

prior to the ban, a substantial proportion of hunters were concerned about the use of SWDs; however, most hunters did not agree that a ban of SWDs was necessary.

Among all duck hunters at Shiawassee River SGA in 2009 and 2010 combined, 72% (1,504 hunters) reported that the ban of SWDs did not affect how frequently they hunted ducks (Table 6). In contrast, 13% (277 hunters) indicated that they duck hunted less frequently because of the ban, and 5% (105 hunters) reported they hunted more frequently. Thus, the ban of SWDs did not affect how frequently most people hunted ducks at Shiawassee River SGA in 2010.

Although the ban of SWDs did not affect how often most people hunted ducks at Shiawassee River SGA in 2010, more people reported a decrease in hunting frequency because of the ban than hunters reporting an increase (i.e., 277 versus 105 hunters, Table 6). Moreover, about 73 duck hunters did not hunt at Shiawassee River SGA in 2010 because of the ban of SWDs (Table 7). In contrast, about 24 duck hunters that hunted only during 2010 indicated they hunted more frequently at Shiawassee River SGA because of the ban (Table 6). Thus, the ban of SWDs lead to a net loss of about 50 duck hunters in 2010. In 2010, about 100 fewer people hunted ducks at Shiawassee River SGA, based on mandatory check tally. Thus, it appears that about 50% of the loss in overall duck hunter numbers (i.e., 49 of 94 hunters) could be attributed to the ban of SWDs.

Among all duck hunters at Shiawassee River SGA in 2009 and 2010 combined, 46% (950 hunters) reported that the ban of SWDs did not affect how many ducks they harvested at Shiawassee River SGA in 2010 (Table 8). In contrast, 19% (405 hunters) indicated their harvest of ducks decreased because of the ban, but 9% (192 hunters) reported their harvest increased. Thus, more hunters reported the ban reduced their duck harvest than hunters that reported an increase in harvest, which was consistent with overall decline of ducks taken in 2009 than 2010 (mandatory check tally was 8,207 ducks in 2009 and 7,084 ducks in 2010).

Among the duck hunters that hunted at Shiawassee River SGA in 2010, 29% (473 hunters) reported that the quality of their hunt improved because of the ban of SWDs, while 21% (348 hunters) reported the ban decreased the quality of their hunt (Table 5). Thus, the ban of SWDs produced a net gain of 125 hunters experiencing improved hunt quality in 2010. However, this comparison neglects to account for hunters that stopped hunting because of the ban (i.e., net loss of 49 hunters). Accounting for these hunters, the ban of SWDs produced a net gain of about 75 hunters experiencing improved hunt quality in 2010. Thus, the ban of SWDs marginally improved the quality of hunt for all hunters from 2009 and 2010 combined.

Among the 2010 duck hunters at Shiawassee River SGA, nearly equal proportions indicated that they would increase (15%) their hunting activity as hunters that would decrease (14%) their hunting activity because of the ban of SWDs (Table 16). Thus, the net effect of the ban of SWDs on hunting effort in the next two years appears to be negligible.

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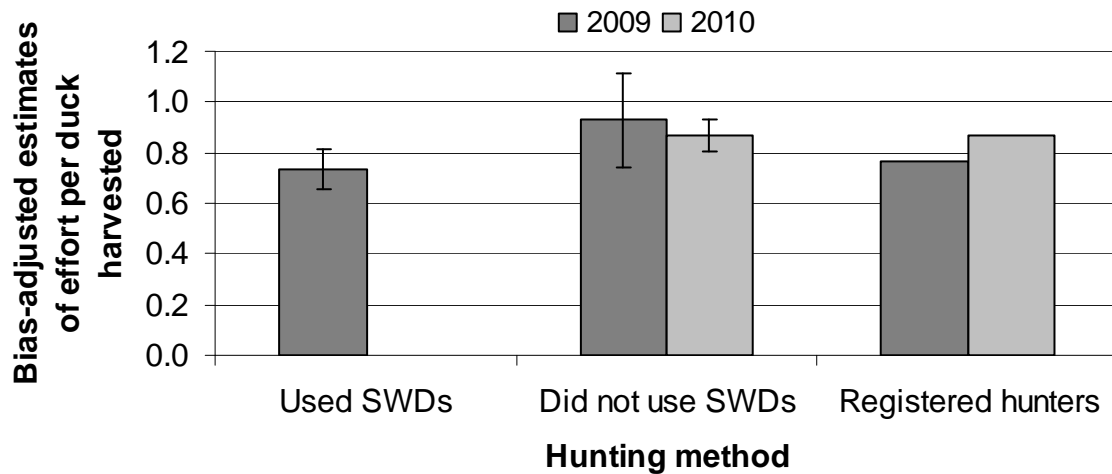


Figure 1. Estimated number of days of effort required to take a duck at Shiawassee River SGA by hunting method during 2009 and 2010 hunting seasons. Vertical bars represent the 95% confidence interval. The estimate for all registered hunters was derived from data collected from all hunters at Shiawassee River SGA (i.e. mandatory reporting).

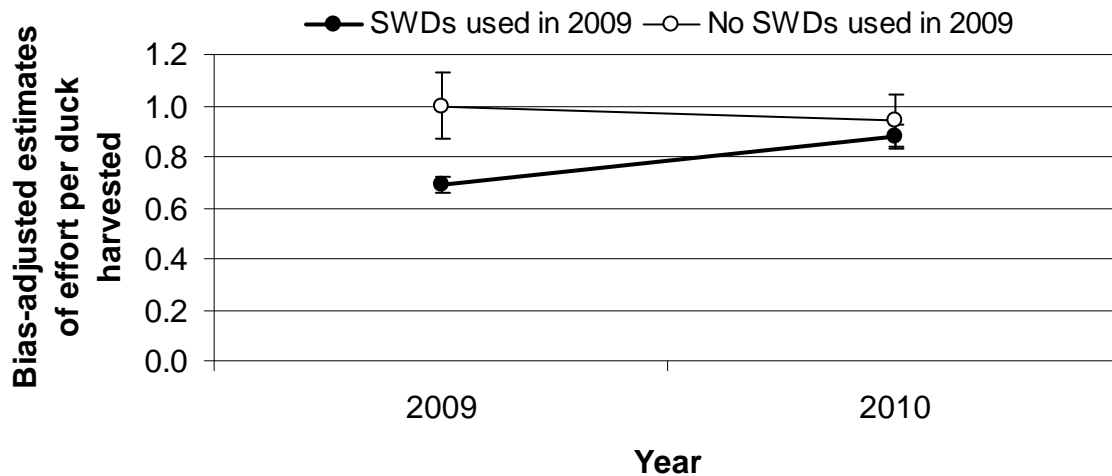


Figure 2. Estimated number of days of effort required to take a duck at Shiawassee River SGA by hunting method during 2009 and 2010. Vertical bars represent the 95% confidence interval. Hunters that did not hunt both years and hunters that used more than one hunting method in 2009 were excluded from sample of hunters used to derive estimates.

Table 1. Unadjusted estimates of the number of duck hunters, days of hunting effort, duck harvest, and hunting effort per duck harvested at Shiawassee River SGA, summarized by year and hunting method used (i.e., used SWDs or did not use SWDs).

| Year and hunting method | Hunters | | Effort | | Harvest | | Effort/kill | |
|-------------------------|---------|--------|--------|--------|---------|--------|-------------|--------|
| | No. | 95% CL | No. | 95% CL | No. | 95% CL | Mean | 95% CL |
| 2009 | | | | | | | | |
| Used SWDs | 1,454 | 36 | 9,852 | 490 | 18,291 | 1,134 | 0.54 | 0.02 |
| Did not use SWDs | 813 | 35 | 3,602 | 268 | 5,518 | 515 | 0.65 | 0.05 |
| 2010 ^a | | | | | | | | |
| Did not use SWDs | 1,825 | 32 | 10,626 | 509 | 16,666 | 1,112 | 0.64 | 0.03 |

^aSWDs banned in 2010.

Table 2. Differences between survey estimates and harvest tallies from mandatory harvest checks of duck hunters at Shiawassee River SGA in 2010.

| Source of estimate and differences between estimates | Parameter | | | |
|--|---------------|-------------------|---------------|------------------|
| | Hunters (No.) | Effort (No. days) | Harvest (No.) | Mean effort/kill |
| Survey estimate | 1,825 | 10,626 | 16,666 | 0.64 |
| Mandatory check tally | 1,638 | 6,145 | 7,084 | 0.87 |
| Difference (%) | 11.4 | 72.9 | 135.3 | -26.5 |
| Correction factor | 0.8977 | 0.5783 | 0.4251 | 1.3605 |

Table 3. Bias-adjusted estimates of the number of duck hunters, days of hunting effort, duck harvest, and hunting effort per duck harvested at Shiawassee River SGA, summarized by year and hunting method used (i.e., used SWDs or did not use SWDs).^a

| Year and hunting method | Hunters | | Effort | | Harvest | | Effort/kill | |
|-------------------------|---------|--------|--------|--------|---------|--------|-------------|--------|
| | No. | 95% CL | No. | 95% CL | No. | 95% CL | Mean | 95% CL |
| 2009 | | | | | | | | |
| Used SWDs | 1,305 | 33 | 5,697 | 283 | 7,775 | 482 | 0.73 | 0.08 |
| Did not use SWDs | 729 | 31 | 2,083 | 155 | 2,346 | 219 | 0.93 | 0.18 |
| 2010 ^b | | | | | | | | |
| Did not use SWDs | 1,638 | 29 | 6,145 | 294 | 7,084 | 473 | 0.87 | 0.07 |

^aOriginal estimates presented in Table 1 were adjusted for bias using the correction factor presented in Table 2.

^bSWDs banned in 2010.

Table 4. Proportion of duck hunters that approved or disapproved of hunting ducks with SWDs at Shiawassee River SGA.^a

| Duck hunter group | Hunters in group ^b | | Opinion of hunters | | | | | | | |
|----------------------------------|-------------------------------|--------|--------------------|--------|----------|--------|-------------|--------|-----------|--------|
| | | | Approved | | Not sure | | Disapproved | | No answer | |
| | No. | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL |
| Used SWDs; hunted 2009 only | 320 | 23 | 56 | 4 | 20 | 3 | 22 | 3 | 3 | 1 |
| No SWDs used; hunted 2009 only | 129 | 16 | 31 | 6 | 31 | 6 | 35 | 6 | 3 | 2 |
| No SWDs used; hunted 2010 only | 424 | 26 | 42 | 3 | 31 | 3 | 26 | 3 | 1 | 1 |
| Used SWDs; hunted 2009 & 2010 | 985 | 33 | 46 | 2 | 20 | 2 | 34 | 2 | 1 | 0 |
| No SWDs used; hunted 2009 & 2010 | 229 | 20 | 38 | 5 | 24 | 4 | 38 | 5 | 0 | 0 |
| Hunted in 2009 | 1,664 | 28 | 45 | 2 | 21 | 1 | 32 | 2 | 1 | 0 |
| Hunted in 2010 | 1,638 | 29 | 43 | 2 | 23 | 1 | 32 | 2 | 1 | 0 |
| Hunted 2009 or 2010 | 2,087 | 14 | 45 | 2 | 23 | 1 | 31 | 1 | 1 | 0 |

^aEstimates among active hunters (i.e., excluded people that did not hunt ducks).

^bBias-adjusted estimates.

Table 5. Proportion of duck hunters that reported the ban of SWDs increased or decreased the quality of duck hunting at Shiawassee River SGA in 2010.^a

| Duck hunter group | Hunters in group ^b | | Hunt quality | | | | | | | |
|----------------------------------|-------------------------------|--------|--------------|--------|----------|--------|-----------|--------|-----------|--------|
| | | | Improved | | Not sure | | Decreased | | No answer | |
| | No. | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL |
| Used SWDs; hunted 2009 & 2010 | 985 | 33 | 33 | 2 | 40 | 2 | 27 | 2 | 1 | 0 |
| No SWDs used; hunted 2009 & 2010 | 229 | 20 | 34 | 4 | 54 | 5 | 11 | 3 | 1 | 1 |
| No SWDs used; Hunted 2010 only | 424 | 26 | 16 | 3 | 69 | 3 | 15 | 2 | 0 | 0 |
| Hunted in 2010 | 1,638 | 29 | 29 | 2 | 49 | 2 | 21 | 1 | 1 | 0 |

^aEstimates among active 2010 hunters (i.e., excluded people that did not hunt ducks in 2010).

^bBias-adjusted estimates.

Table 6. Proportion of duck hunters that increased or decreased how often they hunted at Shiawassee River SGA in 2010 because of the ban of SWDs.^a

| Duck hunter group | Hunters in group ^b | | Opinion of hunters | | | | | | | | | |
|----------------------------------|-------------------------------|--------|--------------------|--------|-----------|--------|-----------|--------|----------|--------|-----------|--------|
| | No. | 95% CL | Increased | | Decreased | | No change | | Not sure | | No answer | |
| | | | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL |
| Used SWDs; hunted 2009 only | 320 | 23 | 0 | 0 | 25 | 3 | 56 | 4 | 15 | 3 | 5 | 2 |
| No SWDs used; hunted 2009 only | 129 | 16 | 0 | 0 | 1 | 1 | 81 | 5 | 12 | 4 | 5 | 3 |
| No SWDs used; hunted 2010 only | 424 | 26 | 6 | 2 | 8 | 2 | 69 | 3 | 16 | 3 | 1 | 1 |
| Used SWDs; hunted 2009 & 2010 | 985 | 33 | 6 | 1 | 15 | 2 | 75 | 2 | 3 | 1 | 1 | 0 |
| No SWDs used; hunted 2009 & 2010 | 229 | 20 | 9 | 3 | 6 | 2 | 81 | 4 | 4 | 2 | 1 | 1 |
| Hunted in 2009 | 1,664 | 28 | 5 | 1 | 15 | 1 | 73 | 2 | 6 | 1 | 2 | 0 |
| Hunted in 2010 | 1,638 | 29 | 6 | 1 | 12 | 1 | 75 | 2 | 6 | 1 | 1 | 0 |
| Hunted 2009 or 2010 | 2,087 | 14 | 5 | 1 | 13 | 1 | 72 | 1 | 8 | 1 | 2 | 0 |

^aEstimates among active hunters (i.e., excluded people that did not hunt ducks).

^bBias-adjusted estimates.

Table 7. Proportion of duck hunters that avoided hunting ducks completely at Shiawassee River SGA in 2010 because of the ban of SWDs.^a

| Duck hunter group | Hunters in group ^b | | Hunters that stopped hunting because of ban | | | | | | | |
|--------------------------------|-------------------------------|--------|---|--------|----|--------|-----------|--------|-----------|--------|
| | | | Yes | | No | | Uncertain | | No answer | |
| | No. | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL |
| Used SWDs; hunted 2009 only | 356 | 26 | 23 | 3 | 67 | 4 | 8 | 2 | 3 | 1 |
| No SWDs used; hunted 2009 only | 144 | 17 | 4 | 3 | 87 | 4 | 4 | 3 | 4 | 3 |

^aEstimates among active hunters (i.e., excluded people that did not hunt ducks).

^bBias-adjusted estimates.

Table 8. Proportion of duck hunters that reported increased or decreased harvest of ducks at Shiawassee River SGA in 2010 following the ban of SWDs.^a

| Duck hunter group | Hunters in group ^b | | Opinion of hunters | | | | | | | | | |
|----------------------------------|-------------------------------|--------|--------------------|--------|-----------|--------|-----------|--------|----------|--------|-----------|--------|
| | | | Increased | | Decreased | | No change | | Not sure | | No answer | |
| | No. | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL |
| Used SWDs; hunted 2009 only | 320 | 23 | 0 | 0 | 15 | 3 | 49 | 4 | 27 | 4 | 8 | 2 |
| No SWDs used; hunted 2009 only | 129 | 16 | 0 | 0 | 0 | 0 | 71 | 6 | 24 | 5 | 4 | 3 |
| No SWDs used; hunted 2010 only | 424 | 26 | 6 | 2 | 10 | 2 | 42 | 3 | 42 | 3 | 0 | 0 |
| Used SWDs; hunted 2009 & 2010 | 985 | 33 | 13 | 2 | 30 | 2 | 40 | 2 | 16 | 2 | 0 | 0 |
| No SWDs used; hunted 2009 & 2010 | 229 | 20 | 17 | 4 | 8 | 3 | 55 | 5 | 20 | 4 | 0 | 0 |
| Hunted in 2009 | 1,664 | 28 | 10 | 1 | 22 | 1 | 46 | 2 | 20 | 1 | 2 | 1 |
| Hunted in 2010 | 1,638 | 29 | 12 | 1 | 22 | 1 | 43 | 2 | 24 | 1 | 0 | 0 |
| Hunted 2009 or 2010 | 2,087 | 14 | 9 | 1 | 19 | 1 | 46 | 2 | 24 | 1 | 2 | 0 |

^aEstimates among active hunters (i.e., excluded people that did not hunt ducks).

^bBias-adjusted estimates.

Table 9. Proportion of duck hunters that reported they would increase or decrease how often they hunted ducks at Shiawassee River SGA in future years because of the ban of SWDs.^a

| Duck hunter group | Hunters in group ^b | | Opinion of hunters | | | | | | | | | |
|----------------------------------|-------------------------------|--------|--------------------|--------|-----------|--------|-----------|--------|----------|--------|-----------|--------|
| | | | Increased | | Decreased | | No change | | Not sure | | No answer | |
| | No. | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL |
| Used SWDs; hunted 2009 only | 320 | 23 | 7 | 2 | 30 | 4 | 48 | 4 | 13 | 3 | 3 | 1 |
| No SWDs used; hunted 2009 only | 129 | 16 | 18 | 5 | 4 | 3 | 68 | 6 | 5 | 3 | 4 | 3 |
| No SWDs used; hunted 2010 only | 424 | 26 | 15 | 2 | 9 | 2 | 62 | 3 | 14 | 2 | 0 | 0 |
| Used SWDs; hunted 2009 & 2010 | 985 | 33 | 13 | 2 | 17 | 2 | 64 | 2 | 5 | 1 | 0 | 0 |
| No SWDs used; hunted 2009 & 2010 | 229 | 20 | 20 | 4 | 8 | 3 | 68 | 4 | 4 | 2 | 0 | 0 |
| Hunted in 2009 | 1,664 | 28 | 13 | 1 | 17 | 1 | 62 | 2 | 7 | 1 | 1 | 0 |
| Hunted in 2010 | 1,638 | 29 | 15 | 1 | 14 | 1 | 64 | 2 | 7 | 1 | 0 | 0 |
| Hunted 2009 or 2010 | 2,087 | 14 | 14 | 1 | 16 | 1 | 62 | 2 | 8 | 1 | 1 | 0 |

^aEstimates among active hunters (i.e., excluded people that did not hunt ducks).

^bBias-adjusted estimates.

Table 10. Proportion of duck hunters that normally hunted ducks on public and private lands outside of Shiawassee River SGA.^a

| Duck hunter group | Land type | | | | | | | | | | | |
|----------------------------------|-------------------------------|--------|------------------------|--------|-----------------------|--------|-------------------------------|--------|-----------------------------------|--------|-----------|--------|
| | Hunters in group ^b | | Primarily private land | | Primarily public land | | Both private and public lands | | Only hunt at Shiawassee River SGA | | No answer | |
| | No. | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL |
| Used SWDs; hunted 2009 only | 320 | 23 | 13 | 3 | 30 | 4 | 49 | 4 | 6 | 2 | 1 | 1 |
| No SWDs used; hunted 2009 only | 129 | 16 | 10 | 4 | 33 | 6 | 47 | 6 | 4 | 3 | 5 | 3 |
| No SWDs used; hunted 2010 only | 424 | 26 | 10 | 2 | 33 | 3 | 46 | 3 | 10 | 2 | 2 | 1 |
| Used SWDs; hunted 2009 & 2010 | 985 | 33 | 6 | 1 | 32 | 2 | 52 | 2 | 8 | 1 | 2 | 1 |
| No SWDs used; hunted 2009 & 2010 | 229 | 20 | 13 | 3 | 22 | 4 | 58 | 5 | 7 | 2 | 1 | 1 |
| Hunted in 2009 | 1,664 | 28 | 9 | 1 | 31 | 2 | 52 | 2 | 7 | 1 | 2 | 0 |
| Hunted in 2010 | 1,638 | 29 | 8 | 1 | 31 | 2 | 51 | 2 | 8 | 1 | 2 | 0 |
| Hunted 2009 or 2010 | 2,087 | 14 | 9 | 1 | 31 | 1 | 50 | 2 | 8 | 1 | 2 | 0 |

^aEstimates among active hunters (i.e., excluded people that did not hunt ducks).

^bBias-adjusted estimates.

Table 11. Proportion of duck hunters that hunted ducks with the aid of SWDs outside of Shiawassee River SGA in 2010.^a

| Duck hunter group | Frequency | | | | | | | | | | | | | |
|----------------------------------|-------------------------------|--------|-------|--------|--------------|--------|---------|--------|--------|--------|--------------------|--------|-----------|--------|
| | Hunters in group ^b | | Never | | Occasionally | | Usually | | Always | | Did not hunt ducks | | No answer | |
| | No. | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL |
| Used SWDs; hunted 2009 only | 320 | 23 | 17 | 3 | 15 | 3 | 21 | 3 | 28 | 4 | 18 | 3 | 1 | 1 |
| No SWDs used; hunted 2009 only | 129 | 16 | 48 | 6 | 31 | 6 | 10 | 4 | 1 | 1 | 5 | 3 | 4 | 3 |
| No SWDs used; hunted 2010 only | 424 | 26 | 36 | 3 | 31 | 3 | 15 | 2 | 12 | 2 | 5 | 2 | 1 | 1 |
| Used SWDs; hunted 2009 & 2010 | 985 | 33 | 24 | 2 | 26 | 2 | 21 | 2 | 24 | 2 | 4 | 1 | 0 | 0 |
| No SWDs used; hunted 2009 & 2010 | 229 | 20 | 47 | 5 | 36 | 5 | 8 | 3 | 6 | 2 | 2 | 1 | 1 | 1 |
| Hunted in 2009 | 1,664 | 28 | 28 | 2 | 26 | 2 | 19 | 1 | 20 | 1 | 6 | 1 | 1 | 0 |
| Hunted in 2010 | 1,638 | 29 | 31 | 2 | 29 | 2 | 18 | 1 | 18 | 1 | 4 | 1 | 1 | 0 |
| Hunted 2009 or 2010 | 2,087 | 14 | 30 | 1 | 27 | 1 | 18 | 1 | 19 | 1 | 6 | 1 | 1 | 0 |

^aEstimates among active hunters (i.e., excluded people that did not hunt ducks).

^bBias-adjusted estimates.

Table 12. Proportion of duck hunters at Shiawassee River SGA that approved or disapproved of duck hunters using SWDs in Michigan.^a

| Duck hunter group | Hunters in group ^b | | Opinion of hunters | | | | | | | |
|--|-------------------------------|--------|--------------------|--------|----------|--------|-------------|--------|-----------|--------|
| | | | Approved | | Not sure | | Disapproved | | No answer | |
| | No. | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL |
| Used SWDs; hunted 2009 only | 320 | 23 | 72 | 4 | 14 | 3 | 13 | 3 | 2 | 1 |
| No SWDs used; hunted 2009 only | 129 | 16 | 41 | 6 | 25 | 5 | 31 | 6 | 3 | 2 |
| No SWDs used; hunted 2010 only | 424 | 26 | 58 | 3 | 29 | 3 | 13 | 2 | 0 | 0 |
| Used SWDs; hunted 2009 & 2010 | 985 | 33 | 59 | 2 | 23 | 2 | 18 | 2 | 1 | 0 |
| No SWDs used; hunted 2009 & 2010 | 229 | 20 | 35 | 4 | 29 | 4 | 35 | 4 | 1 | 1 |
| Hunted in 2009 | 1,664 | 28 | 56 | 2 | 22 | 1 | 20 | 1 | 1 | 0 |
| Hunted in 2010 | 1,638 | 29 | 55 | 2 | 25 | 2 | 19 | 1 | 1 | 0 |
| Hunted 2009 or 2010 | 2,087 | 14 | 57 | 2 | 24 | 1 | 19 | 1 | 1 | 0 |

^aEstimates among active hunters (i.e., excluded people that did not hunt ducks).

^bBias-adjusted estimates.

Table 13. Proportion of duck hunters at Shiawassee River SGA that agreed or disagreed that SWDs should never be restricted in Michigan.^a

| Duck hunter group | Hunters in group ^b | | Opinion of hunters | | | | | | | |
|----------------------------------|-------------------------------|--------|--------------------|--------|----------|--------|-----------|--------|-----------|--------|
| | | | Agreed | | Not sure | | Disagreed | | No answer | |
| | No. | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL |
| Used SWDs; hunted 2009 only | 320 | 23 | 60 | 4 | 10 | 2 | 28 | 4 | 2 | 1 |
| No SWDs used; hunted 2009 only | 129 | 16 | 38 | 6 | 20 | 5 | 35 | 6 | 7 | 3 |
| No SWDs used; hunted 2010 only | 424 | 26 | 45 | 3 | 24 | 3 | 30 | 3 | 1 | 1 |
| Used SWDs; hunted 2009 & 2010 | 985 | 33 | 45 | 2 | 20 | 2 | 34 | 2 | 1 | 0 |
| No SWDs used; hunted 2009 & 2010 | 229 | 20 | 28 | 4 | 25 | 4 | 46 | 5 | 1 | 1 |
| Hunted in 2009 | 1,664 | 28 | 45 | 2 | 19 | 1 | 34 | 2 | 2 | 0 |
| Hunted in 2010 | 1,638 | 29 | 42 | 2 | 22 | 1 | 34 | 2 | 1 | 0 |
| Hunted 2009 or 2010 | 2,087 | 14 | 45 | 2 | 20 | 1 | 33 | 1 | 2 | 0 |

^aEstimates among active hunters (i.e., excluded people that did not hunt ducks).

^bBias-adjusted estimates.

Table 14. Proportion of duck hunters at Shiawassee River SGA that agreed or disagreed that SWDs should be banned in Michigan because they are an unethical hunting method.^a

| Duck hunter group | Hunters in group ^b | | Opinion of hunters | | | | | | | |
|----------------------------------|-------------------------------|--------|--------------------|--------|----------|--------|-----------|--------|-----------|--------|
| | No. | 95% CL | Agreed | | Not sure | | Disagreed | | No answer | |
| | | | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL |
| Used SWDs; hunted 2009 only | 320 | 23 | 11 | 2 | 9 | 2 | 78 | 3 | 2 | 1 |
| No SWDs used; hunted 2009 only | 129 | 16 | 20 | 5 | 19 | 5 | 56 | 6 | 5 | 3 |
| No SWDs used; hunted 2010 only | 424 | 26 | 9 | 2 | 20 | 3 | 69 | 3 | 1 | 1 |
| Used SWDs; hunted 2009 & 2010 | 985 | 33 | 11 | 1 | 13 | 2 | 76 | 2 | 1 | 0 |
| No SWDs used; hunted 2009 & 2010 | 229 | 20 | 25 | 4 | 22 | 4 | 52 | 5 | 1 | 1 |
| Hunted in 2009 | 1,664 | 28 | 13 | 1 | 14 | 1 | 71 | 2 | 2 | 0 |
| Hunted in 2010 | 1,638 | 29 | 12 | 1 | 16 | 1 | 71 | 2 | 1 | 0 |
| Hunted 2009 or 2010 | 2,087 | 14 | 12 | 1 | 15 | 1 | 71 | 1 | 1 | 0 |

^aEstimates among active hunters (i.e., excluded people that did not hunt ducks).

^bBias-adjusted estimates.

Table 15. Proportion of duck hunters at Shiawassee River SGA that agreed or disagreed that SWDs should be banned in Michigan because if used improperly they can impact hunting success of nearby hunters.^a

| Duck hunter group | Hunters in group ^b | | Opinion of hunters | | | | | | | |
|----------------------------------|-------------------------------|--------|--------------------|--------|----------|--------|-----------|--------|-----------|--------|
| | | | Agreed | | Not sure | | Disagreed | | No answer | |
| | No. | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL |
| Used SWDs; hunted 2009 only | 320 | 23 | 24 | 3 | 20 | 3 | 54 | 4 | 2 | 1 |
| No SWDs used; hunted 2009 only | 129 | 16 | 36 | 6 | 26 | 6 | 33 | 6 | 4 | 3 |
| No SWDs used; hunted 2010 only | 424 | 26 | 29 | 3 | 28 | 3 | 42 | 3 | 1 | 1 |
| Used SWDs; hunted 2009 & 2010 | 985 | 33 | 36 | 2 | 17 | 2 | 46 | 2 | 1 | 0 |
| No SWDs used; hunted 2009 & 2010 | 229 | 20 | 47 | 5 | 21 | 4 | 31 | 4 | 1 | 1 |
| Hunted in 2009 | 1,664 | 28 | 35 | 2 | 19 | 1 | 45 | 2 | 1 | 0 |
| Hunted in 2010 | 1,638 | 29 | 36 | 2 | 20 | 1 | 43 | 2 | 1 | 0 |
| Hunted 2009 or 2010 | 2,087 | 14 | 34 | 1 | 21 | 1 | 44 | 2 | 1 | 0 |

^aEstimates among active hunters (i.e., excluded people that did not hunt ducks).

^bBias-adjusted estimates.

Table 16. Proportion of duck hunters at Shiawassee River SGA that agreed or disagreed that SWDs should be regulated only if their use results in declining duck numbers and shorter hunting seasons.^a

| Duck hunter group | Hunters in group ^b | | Opinion of hunters | | | | | | | |
|----------------------------------|-------------------------------|--------|--------------------|--------|----------|--------|-----------|--------|-----------|--------|
| | | | Agreed | | Not sure | | Disagreed | | No answer | |
| | No. | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL |
| Used SWDs; hunted 2009 only | 320 | 23 | 50 | 4 | 16 | 3 | 32 | 4 | 2 | 1 |
| No SWDs used; hunted 2009 only | 129 | 16 | 36 | 6 | 23 | 5 | 34 | 6 | 7 | 3 |
| No SWDs used; hunted 2010 only | 424 | 26 | 44 | 3 | 27 | 3 | 27 | 3 | 1 | 1 |
| Used SWDs; hunted 2009 & 2010 | 985 | 33 | 46 | 2 | 20 | 2 | 34 | 2 | 1 | 0 |
| No SWDs used; hunted 2009 & 2010 | 229 | 20 | 32 | 4 | 23 | 4 | 43 | 5 | 2 | 1 |
| Hunted in 2009 | 1,664 | 28 | 44 | 2 | 20 | 1 | 35 | 2 | 2 | 0 |
| Hunted in 2010 | 1,638 | 29 | 43 | 2 | 22 | 1 | 33 | 2 | 1 | 0 |
| Hunted 2009 or 2010 | 2,087 | 14 | 44 | 2 | 21 | 1 | 33 | 1 | 2 | 0 |

^aEstimates among active hunters (i.e., excluded people that did not hunt ducks).

^bBias-adjusted estimates.

Table 17. Proportion of duck hunters at Shiawassee River SGA that agreed or disagreed that SWDs should be banned in Michigan only if banned in all states.^a

| Duck hunter group | Hunters in group ^b | | Opinion of hunters | | | | | | | |
|----------------------------------|-------------------------------|--------|--------------------|--------|----------|--------|-----------|--------|-----------|--------|
| | No. | 95% CL | Agreed | | Not sure | | Disagreed | | No answer | |
| | | | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL |
| Used SWDs; hunted 2009 only | 320 | 23 | 44 | 4 | 7 | 2 | 47 | 4 | 2 | 1 |
| No SWDs used; hunted 2009 only | 129 | 16 | 23 | 5 | 22 | 5 | 48 | 6 | 7 | 3 |
| No SWDs used; hunted 2010 only | 424 | 26 | 36 | 3 | 20 | 3 | 43 | 3 | 1 | 1 |
| Used SWDs; hunted 2009 & 2010 | 985 | 33 | 40 | 2 | 13 | 1 | 46 | 2 | 1 | 0 |
| No SWDs used; hunted 2009 & 2010 | 229 | 20 | 26 | 4 | 17 | 4 | 56 | 5 | 1 | 1 |
| Hunted in 2009 | 1,664 | 28 | 38 | 2 | 13 | 1 | 48 | 2 | 2 | 0 |
| Hunted in 2010 | 1,638 | 29 | 37 | 2 | 15 | 1 | 47 | 2 | 1 | 0 |
| Hunted 2009 or 2010 | 2,087 | 14 | 37 | 2 | 14 | 1 | 47 | 2 | 1 | 0 |

^aEstimates among active hunters (i.e., excluded people that did not hunt ducks).

^bBias-adjusted estimates.

Table 18. Proportion of duck hunters at Shiawassee River SGA that agreed or disagreed that SWDs should be banned in Michigan regardless if banned in other states.^a

| Duck hunter group | Hunters in group ^b | | Opinion of hunters | | | | | | | |
|----------------------------------|-------------------------------|--------|--------------------|--------|----------|--------|-----------|--------|-----------|--------|
| | No. | 95% CL | Agreed | | Not sure | | Disagreed | | No answer | |
| | | | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL |
| Used SWDs; hunted 2009 only | 320 | 23 | 14 | 3 | 8 | 2 | 76 | 3 | 2 | 1 |
| No SWDs used; hunted 2009 only | 129 | 16 | 25 | 5 | 18 | 5 | 53 | 6 | 4 | 3 |
| No SWDs used; hunted 2010 only | 424 | 26 | 9 | 2 | 22 | 3 | 67 | 3 | 1 | 1 |
| Used SWDs; hunted 2009 & 2010 | 985 | 33 | 15 | 2 | 15 | 2 | 70 | 2 | 1 | 0 |
| No SWDs used; hunted 2009 & 2010 | 229 | 20 | 28 | 4 | 22 | 4 | 49 | 5 | 1 | 1 |
| Hunted in 2009 | 1,664 | 28 | 17 | 1 | 15 | 1 | 67 | 2 | 1 | 0 |
| Hunted in 2010 | 1,638 | 29 | 15 | 1 | 18 | 1 | 66 | 2 | 1 | 0 |
| Hunted 2009 or 2010 | 2,087 | 14 | 16 | 1 | 16 | 1 | 67 | 1 | 1 | 0 |

^aEstimates among active hunters (i.e., excluded people that did not hunt ducks).

^bBias-adjusted estimates.

Table 19. Proportion of duck hunters at Shiawassee River SGA that agreed or disagreed that SWDs should be banned in Michigan on public lands only.^a

| Duck hunter group | Hunters in group ^b | | Opinion of hunters | | | | | | | |
|----------------------------------|-------------------------------|--------|--------------------|--------|----------|--------|-----------|--------|-----------|--------|
| | No. | 95% CL | Agreed | | Not sure | | Disagreed | | No answer | |
| | | | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL |
| Used SWDs; hunted 2009 only | 320 | 23 | 10 | 2 | 11 | 2 | 76 | 3 | 2 | 1 |
| No SWDs used; hunted 2009 only | 129 | 16 | 10 | 4 | 16 | 5 | 68 | 6 | 5 | 3 |
| No SWDs used; hunted 2010 only | 424 | 26 | 13 | 2 | 21 | 3 | 65 | 3 | 1 | 1 |
| Used SWDs; hunted 2009 & 2010 | 985 | 33 | 15 | 2 | 12 | 1 | 71 | 2 | 1 | 1 |
| No SWDs used; hunted 2009 & 2010 | 229 | 20 | 14 | 3 | 25 | 4 | 58 | 5 | 2 | 1 |
| Hunted in 2009 | 1,664 | 28 | 14 | 1 | 14 | 1 | 70 | 2 | 2 | 0 |
| Hunted in 2010 | 1,638 | 29 | 14 | 1 | 16 | 1 | 68 | 2 | 1 | 0 |
| Hunted 2009 or 2010 | 2,087 | 14 | 13 | 1 | 16 | 1 | 69 | 1 | 2 | 0 |

^aEstimates among active hunters (i.e., excluded people that did not hunt ducks).

^bBias-adjusted estimates.

Table 20. Proportion of duck hunters at Shiawassee River SGA that agreed or disagreed that SWDs should be banned in Michigan on Managed Waterfowl Hunt Areas.^a

| Duck hunter group | Hunters in group ^b | | Opinion of hunters | | | | | | | |
|----------------------------------|-------------------------------|--------|--------------------|--------|----------|--------|-----------|--------|-----------|--------|
| | No. | 95% CL | Agreed | | Not sure | | Disagreed | | No answer | |
| | | | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL |
| Used SWDs; hunted 2009 only | 320 | 23 | 17 | 3 | 15 | 3 | 66 | 4 | 2 | 1 |
| No SWDs used; hunted 2009 only | 129 | 16 | 16 | 5 | 21 | 5 | 56 | 6 | 7 | 3 |
| No SWDs used; hunted 2010 only | 424 | 26 | 24 | 3 | 23 | 3 | 51 | 3 | 1 | 1 |
| Used SWDs; hunted 2009 & 2010 | 985 | 33 | 29 | 2 | 14 | 2 | 56 | 2 | 1 | 1 |
| No SWDs used; hunted 2009 & 2010 | 229 | 20 | 27 | 4 | 24 | 4 | 48 | 5 | 1 | 1 |
| Hunted in 2009 | 1,664 | 28 | 25 | 2 | 16 | 1 | 57 | 2 | 2 | 0 |
| Hunted in 2010 | 1,638 | 29 | 27 | 2 | 18 | 1 | 54 | 2 | 1 | 0 |
| Hunted 2009 or 2010 | 2,087 | 14 | 25 | 1 | 17 | 1 | 56 | 2 | 2 | 0 |

^aEstimates among active hunters (i.e., excluded people that did not hunt ducks).

^bBias-adjusted estimates.

Table 21. Proportion of duck hunters at Shiawassee River SGA that agreed or disagreed that SWDs should be banned in Michigan but only during part of the season (for example, prohibit during the first few weeks).^a

| Duck hunter group | Hunters in group ^b | | Opinion of hunters | | | | | | | |
|----------------------------------|-------------------------------|--------|--------------------|--------|----------|--------|-----------|--------|-----------|--------|
| | | | Agreed | | Not sure | | Disagreed | | No answer | |
| | No. | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL |
| Used SWDs; hunted 2009 only | 320 | 23 | 13 | 3 | 16 | 3 | 69 | 4 | 2 | 1 |
| No SWDs used; hunted 2009 only | 129 | 16 | 11 | 4 | 24 | 5 | 57 | 6 | 8 | 3 |
| No SWDs used; hunted 2010 only | 424 | 26 | 17 | 3 | 28 | 3 | 54 | 3 | 1 | 1 |
| Used SWDs; hunted 2009 & 2010 | 985 | 33 | 18 | 2 | 21 | 2 | 60 | 2 | 1 | 0 |
| No SWDs used; hunted 2009 & 2010 | 229 | 20 | 14 | 3 | 25 | 4 | 60 | 5 | 1 | 1 |
| Hunted in 2009 | 1,664 | 28 | 16 | 1 | 21 | 1 | 62 | 2 | 2 | 0 |
| Hunted in 2010 | 1,638 | 29 | 17 | 1 | 23 | 1 | 59 | 2 | 1 | 0 |
| Hunted 2009 or 2010 | 2,087 | 14 | 16 | 1 | 22 | 1 | 60 | 2 | 1 | 0 |

^aEstimates among active hunters (i.e., excluded people that did not hunt ducks).

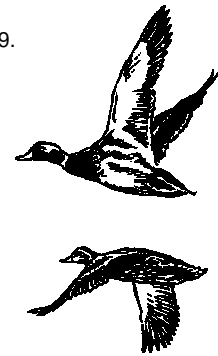
^bBias-adjusted estimates.

Appendix A. The questionnaire sent to a sample of duck hunters in this study.



DUCK HARVEST REPORT FOR THE SHIAWASSEE RIVER STATE GAME AREA

This information is requested under authority of Part 435, 1994 PA 451, M.C.L. 324.43539.



It is important that you complete this questionnaire even if you did not harvest any ducks. Report only **your** hunting activities and the birds that **you** harvested. The first section of this questionnaire deals with hunting activities last season (2009) and the second section deals with the most current season (2010).

Section 1: Duck Hunting at Shiawassee River State Game Area (SGA) in 2009

1. In 2009, did you hunt ducks at Shiawassee River SGA? ¹ ☐ Yes ² ☐ No (If "No", skip to question number 6.)
2. How many days did you hunt ducks with the aid of a spinning-wing decoy at Shiawassee River SGA in 2009? _____ days
3. How many ducks did you harvest with the aid of a spinning-wing decoy at Shiawassee River SGA in 2009? _____ ducks
4. How many days did you hunt ducks without the aid of a spinning-wing decoy at Shiawassee River SGA in 2009? _____ days
5. How many ducks did you harvest without the aid of a spinning-wing decoy at Shiawassee River SGA in 2009? _____ ducks

Section 2: Duck Hunting at Shiawassee River SGA in 2010

Starting in 2010, no spinning-wing decoys were allowed in the Shiawassee River SGA.

6. Prior to 2010, how many years have you hunted ducks at Shiawassee River SGA? _____ years
7. In 2010, did you hunt ducks at Shiawassee River SGA? ¹ ☐ Yes ² ☐ No (If "No", skip to question number 12.)
8. How many days did you hunt ducks at Shiawassee River SGA in 2010? _____ days

Continued on next page

9. How many ducks did you harvest at Shiawassee River SGA in _____ ducks
2010?
10. Were you aware of the ban on spinning wing decoys before you arrived at Shiawassee River SGA? ¹ ☐ Yes ² ☐ No
11. How did the ban on spinning-wing decoys affect the quality of your duck hunting experience at Shiawassee River SGA?
¹ ☐ Greatly Improved quality of hunt ² ☐ Improved quality of hunt ³ ☐ Not Sure ⁴ ☐ Decreased quality of hunt ⁵ ☐ Greatly decreased quality of hunt
12. How much do you approve or disapprove of hunting ducks at Shiawassee River SGA with the aid of spinning-wing decoys?
¹ ☐ Strongly Approve ² ☐ Approve ³ ☐ Not Sure ⁴ ☐ Disapprove ⁵ ☐ Strongly Disapprove
13. Since spinning-wing decoys were banned in 2010, how did this ban affect how often you hunted ducks at Shiawassee River SGA? *(Select one choice)*
¹ ☐ Increased ² ☐ Decreased ³ ☐ No change ⁴ ☐ Not sure
14. Since spinning-wing decoys were banned in 2010, how did this ban affect how many ducks you harvested at Shiawassee River SGA? *(Select one choice)*
¹ ☐ Increased ² ☐ Decreased ³ ☐ No change ⁴ ☐ Not sure
15. Did you avoid hunting ducks completely on Shiawassee River SGA in 2010 because you could not use spinning-wing decoys?
¹ ☐ Yes ² ☐ No ³ ☐ Uncertain
16. How do you believe the ban on spinning wing decoys will affect how often you will hunt at Shiawassee River SGA in future years? *(Select one choice)*
¹ ☐ Increase ² ☐ Decrease ³ ☐ No change ⁴ ☐ Not sure

Section 3: Duck Hunting in Michigan (outside of Shiawassee River SGA) during 2010

17. How long have you hunted ducks in Michigan? _____ years
18. On what land types do you usually duck hunt outside Shiawassee River SGA?
¹ ☐ Primarily private lands ² ☐ Primarily public lands ³ ☐ Both public and private lands ⁴ ☐ Only hunt at Shiawassee River SGA
19. How often did you duck hunt with the aid of a spinning-wing decoy in Michigan outside Shiawassee River SGA during the 2010 hunting season?
¹ ☐ Never ² ☐ Occasionally ³ ☐ Usually ⁴ ☐ Always ⁵ ☐ Didn't hunt ducks

20. How much do you approve or disapprove of other people hunting ducks with the aid of spinning-wing decoys in Michigan outside Shiawassee River SGA?

- ¹ ☐ Strongly approve
 ² ☐ Approve
 ³ ☐ Not sure
 ⁴ ☐ Disapprove
 ⁵ ☐ Strongly disapprove

21. How much do you agree or disagree with the following statements about the use of spinning-wing decoys for duck hunting in Michigan.

| | Strongly Agree | Agree | Not Sure | Disagree | Strongly Disagree |
|---|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| a. The use of spinning-wing decoys should never be restricted. | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |
| b. Spinning-wing decoys should be banned because you feel they are an unethical hunting method. | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |
| c. Spinning wing decoys should be banned because if used improperly or at the wrong times they can negatively impact harvest potential and opportunities of other nearby hunters. | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |
| d. Spinning-wing decoys should be regulated only if their use results in declining duck numbers and shorter hunting seasons. | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |

22. How much do you agree or disagree with the following statements about a possible ban on motorized spinning-wing decoys in Michigan?

| | Strongly Agree | Agree | Not Sure | Disagree | Strongly Disagree |
|--|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| a. Spinning wing decoys should be banned in Michigan only if banned in all states. | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |
| b. Spinning wing decoys should be banned in Michigan regardless if banned in other states. | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |
| c. Spinning wing decoys should be banned in Michigan on public lands <u>only</u> . | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |
| d. Spinning wing decoys should be banned in Michigan on Managed Waterfowl Hunt Areas <u>only</u> . | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |
| e. Spinning wing decoys should be banned in Michigan but <u>only</u> during part of the season (for example, prohibit during the first few weeks). | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |